

Can Rural Development Projects Generate Social Capital? A Case Study of *Ricinodendron heudelotii* Kernel Marketing in Cameroon

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Abstract Social capital is an important pillar of farmers' livelihoods and its importance for sustainable rural development has been recognised. Nevertheless, the creation of social capital through external interventions remains challenging. This study investigated the generation of social capital within a rural development project of the World Agroforestry Centre to promote *Ricinodendron heudelotii* (Baill) Pierre ex Pax. kernel commercialisation. Combining quantitative and qualitative measurement techniques, the change in social capital over a period of 5 years was evaluated. Households of project villages were compared to control households. Project households increased their social assets significantly at different levels. Development interventions thus enhanced social capital, this improvement was

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mutually reinforced by a positive change in other farmer livelihood assets, in particular financial capital. This study reveals the complexity of social capital generation through external intervention and its implications for farmer livelihoods specifically and development work in general.

Keywords Non-wood forest products · Rural development · Farmers' associations · Sustainable livelihoods · Impact analysis · Bonding · Bridging · Linking

Introduction

Social networks and institutions as well as the interpersonal interactions that sustain them are important aspects of farmers' livelihoods (Nahapiet and Ghoshal 1998; Woolcock and Narayan 2000). These relationships form a valuable resource for the conduct of social affairs, and provide people with resources to cope with aspects of their daily life (DFID 1999; Narayan and Pritchett 1999). The collection of these human interactions and structures are categorised under the term *social capital*, a term that has been very loosely applied in literature to cover a whole range of non-economic aspects (Bebbington 2002; Rydin and Holman 2004; Woolcock 1998).

In the academic world, the concept of social capital has increased in use and importance with the publication of Putnam's influential work in the 1990s (Putnam et al. 1993; Putnam 1995). It is currently applied in a broad range of research areas, for instance, in the area of sustainable development. Linking social capital to sustainable development and sustainable rural development in particular, has gained much interest over the last decade (Rydin and Holman 2004; Woolcock and Narayan 2000; Coleman 1988; Fox and Gershman 2000). Its implementation has proven to significantly affect the efficiency and sustainability of rural development programs (Sorensen 2000; Micheline 2013; Bebbington 1997).

Social capital mainly contributes to sustainable economic development of the poor in two ways: first, it can resolve collective action problems; second, it also enables the reduction of transaction costs between actors (Rydin and Holman 2004; Porter and Lyon 2006). Both are about encouraging relationships between actors. The first aspect focuses on the individual actor in relation to the group. These types of relationships can be categorised under *bonding* social capital, which refers to the links within groups or communities (Rydin and Holman 2004) or also formulated as *connections between people like you* (Woolcock and Sweetser 2002). The second aspect, the reduction of transaction costs between actors, tries to alter the net costs of existing transactions in the form of exchanges between actors (Rydin and Holman 2004). These relationships with *people who are not like you in a some demographic sense* are known as *bridging* social capital (Woolcock and Sweetser 2002). Poor people usually have a close-knit and intensive stock of bonding social capital, while they lack bridging social capital which could connect them with *the outside world* (Woolcock and Narayan 2000).

Recently a third category of social capital has been distinguished, namely *linking* social capital which refers to *connections with people in power, whether they are in*

politically or financially influential positions (Woolcock and Sweetser 2002). It also includes vertical connections to formal institutions (Woolcock 2001). However, the poor rarely possess any kind of linking social capital (Woolcock 2001).

Next to bonding, bridging and linking social capital, Nahapiet and Ghoshal (1998) suggest dividing social capital in three additional clusters or dimensions: structural, relational and cognitive. The structural dimension describes the impersonal configuration of linkages between people or units while the relational dimension focuses on the personal relationships that people have developed with each other. The last dimension is the cognitive one, which assesses the shared representations, interpretations and systems of meaning among parties. The subdivision of social capital into smaller dimensions makes the concept more manageable and facilitates data collection, analysis and interpretation (Nardone et al. 2010).

Although the importance of social capital is recognised by most rural development institutions, it remains a difficult area to take into account during development interventions and even more difficult to intervene in. Contrary to other livelihood capitals it is thought to be much harder to generate through external interventions (Ostrom 2000). Empirical data on social capital in general are limited (Paldam 2000); moreover, data on whether development assistance can enhance social capital are more scarce (Gugerty and Kremer 2000). The few studies that do discuss the matter indicate divergent results (e.g. Vervisch et al. 2013; Sanginga et al. 2010; Michelini 2013). For example, Porter and Lyon (2006) state that in Ghana social capital and groups are often created just because they are what donor organisations ask for, while they are often not sustainable and do not improve livelihoods for the poor. On the other hand, under certain socio-economic conditions, group formation and other social capital enhancements do enable the poor to improve their livelihoods (Facheux et al. 2006, 2012; Sanginga et al. 2010). Understanding how development projects can deal with and reinforce social capital rather than cause its decay during interventions remains a great challenge of development (Vervisch et al. 2013; Fox and Gershman 2000; Woolcock and Narayan 2000).

This paper aims to contribute to narrowing this knowledge gap by examining the impact of development projects on social capital in the tropical humid forest zone of Cameroon. The investigated research-for-development project, called ‘Agroforestry Products for Africa’ (AFTP4A) and led by the World Agroforestry Centre (ICRAF), focuses on the promotion of commercialisation of *Ricinodendron heudelotii* (Baill.) Pierre ex Pax. kernels (njansang). Njansang is a non-timber forest product which is used as a thickening ingredient in soups and stews after crushing the seeds (Fondoun et al. 1999). Trade of kernels provides cash income to many households in Cameroon (Cosyns et al. 2011; Plenderleith 2004; Ayuk et al. 1999). The product is traded on local, national and, to a lesser extent, international markets (Plenderleith 2004). Collecting, processing and trading are labour-intensive activities which are typically done by women (Tchoundjeu and Atangana 2006). External interventions to promote non-timber forest products in rural tropical areas are challenging and many authors have stressed the need to include social aspects to obtain their successful commercialisation (Neumann and Hirsch 2000; Marshall et al. 2003,

2006b; Belcher and Schreckenberg 2007). Although the main goal of the AFTP4A project, described in this paper, was to increase and diversify farmer incomes, the creation of social capital took a prominent place within the project approach.

This study addresses the question of what the impact is of a project targeting commercial development of a non-timber forest product on social capital and whether social capital can be created by external interventions.

Materials and methods

Study Site

Fieldwork was conducted in the tropical humid forest zone of Cameroon, located between 3°52'–4°20'N and 11°57'–12°30'E. The villages in the study zone consist of Bantu smallholder farmers of various ethnic groups. Cropping systems consist of fallow-based food crop production (shifting cultivation), multistrata homegardens and semi-permanent, cash crop plantations of mainly cocoa (*Theobroma cacao*) and lowland robusta coffee (*Coffea canephora*) (Ayuk et al. 1999).

The population in the region has gone through a series of socio-economic revolutions related to different colonization regimes, the economic crisis of the mid 1980s and extreme price changes of the main export products. During German colonization (1880–1930), people were forced to settle along main roads, disrupting people's social structures and semi-nomadic way of life (Diaw 1997). After World War I, the humid forest zone of Cameroon came under French authority. The French stimulated the cultivation of cocoa with the purpose of levying taxes, which together with coffee beans became the main source of cash income for many farmers (Degrande 2005). In 1960, Cameroon (the French part) gained independence and in the 1970s until the mid-1980s, Cameroon's economy flourished following the discovery and export of petrol (Ndoye and Kaimowitz 2000). In 1986, after a decade of abundance, a rapid decline in international coffee, cocoa and petroleum prices and the depletion of Cameroon's petroleum reserves, drove the country to a profound economic crisis. Nevertheless, households in the region have always been capable of adjusting their livelihood strategies in response to these changing environments (Degrande 2005). The most recent important setback for farmers was induced by low international cocoa and coffee prices experienced during the 1990s. Farmers responded by intensifying the cultivation and commercialisation of food crops. By refocusing on alternative income sources instead of revamping traditional cash crop cultivation and thus increasing dependency, non-timber forest product commercialisation, such as njansang trade, gained importance. Although cocoa prices increased again in recent years, to date this trend of intensifying alternative income sources continues.

Within the study zone, villages were located in which research-for-development projects of ICRAF and partners were being implemented at the time of the present study. These projects aim to increase, diversify and stabilise incomes of poor, small-scale farmers by increasing their participation in and benefits from agroforestry tree products' value chains (ICRAF 2007). The project focused on promoting

R. heudelotii domestication and the commercialisation of its kernels. The main project interventions were: (1) setting up institutional marketing arrangements by organising farmers involved in njansang commercialisation in producer groups, further referred to as njansang groups; (2) establishing a market information system to provide the njansang groups with up-to-date market information in order to increase their bargaining power, and establishing links between producers and traders; (3) providing technical support for product processing, more specifically reducing the labour-intensive kernel extraction process (still in a test phase); and (4) installing a village nursery to stimulate the domestication process and planting of njansang trees on farms. At the time of this study, activities were still being monitored by ICRAF, but in the long term, njansang groups are supposed to act independently.

In practice, initial project interventions focused on creating and reinforcing social capital in the villages. This reinforcement follows from ICRAF's vision for successful non-timber forest product commercialisation and implies creating coherent, smoothly functioning non-timber forest product producer groups (Facheux et al. 2006). To establish these groups, trainings sessions were organised, focusing on group dynamics and conflict resolution as well as on more technical aspects concerning the commercialisation process (Table 1).

Sampling Method

Stratified sampling was done at village level. Villages were selected based on the presence or absence of a marketing project conducted by ICRAF and partners. *Project villages* with *project households*, which benefited from a marketing project were selected first. All (four) project villages in the Nyong-et-Mfoumou department were selected. Next, for each of these project villages, a *control village* with its *control households* was selected for comparison. Selection of a control village was based on its similarity with its respective project village with respect to the socio-economic characteristics that could influence njansang commercialisation (Table 2 and 3). The idea behind the selection was that each project and its respective control village and households were alike at the start of project implementation; especially regarding njansang commercialisation. It was also assumed that the selection procedure ensured that the other factors affecting social capital in the different

Table 1 Training programs received by farmers in the different project villages of this study

	Epkwassong	Ondeck	Loum	Ebassi
Training programs				
Group dynamics	V	V	X	V
Conflict management	V	V	X	X
Market functioning	V	V	X	V
Financial management	V	V	X	X
Tree domestication	V	V	X	V

V yes, X no

Table 2 Socio-economic criteria used to select a control village for each project village

Main criteria	Specifications
Market access	Distance to urban market (in space and time) Obstacles/difficulties on the road
<i>Njansang</i> commercialization	Number of households marketing <i>njansang</i> (in 2005 and in 2010)
Access to <i>njansang</i>	Availability of <i>R. heudelotii</i> in region Farmers access to <i>njansang</i>
Village size	Amount of inhabitants in each village
Cultural groups	Ethnic groups

communities such as policies, farmers' livelihood strategies and related associations, etc. were quite similar.

The year 2005 was chosen as a reference year because it coincided with an era before project intervention in all villages (with exception of Epkwassong, where activities had started in 2003 but in 2005 the practical project implementation was still at a premature state, as for example indicated by the absence of group sales). Thus, in 2005, each project and its control village were presumed to be similarly evolved in *njansang* commercialisation. This yielded a total of four project and three control villages (Table 3). There were only three control villages because the village Abamyendjock served as a control village for two project villages, namely Ondeck and Loum in the same area. Within each village, households were randomly selected from all households active in *njansang* commercialisation (resulting in a total sample of $n = 182$, target of 30 households per village). Data were collected during October–November 2010 and July–August 2011.

At household level, data were collected through semi-structured questionnaires featuring retrospective methods according to Omilola's (2009) guidelines. Additional data were gathered through participatory approaches at village level according to the guidelines from Marshall et al. (2006a). More specifically, focus group discussions and interviews with key informants focused on trends and changes within the village following *njansang* commercialisation. Issues such as *njansang* use and management, conflict, resource privatisation, gender, community organisations etc. were discussed. The majority of the questions focused on the situations in 2005 and 2010, whereby 2005 coincides with the era before any project intervention.

The present study used a framework based on the differentiation primarily between bonding, bridging and linking social capital (Woolcock 2001; Putnam 2000), and subsequently between the structural, relational and cognitive dimensions of social capital (Nahapiet and Ghoshal 1998). This resulted in a multi-dimensional framework in which proxies were selected for each dimension (Table 4). Due to the high site and scale dependency of social capital (Grootaert and Bastelaer 2001) the a priori selection of proxies based on literature were considered inadequate. Therefore, most proxies were established after the authors got acquainted with the study environment, i.e. after the first data collection period in 2010. The new proxies were introduced in an additional questionnaire and data on them collected in

Table 3 General information about the sampled villages

	Epkwassong	Nyamvoudou	Ondek	Loum	Abamyendjock	Ebassi	Ongbwang
Closest city with urban market	Akonolinga	Akonolinga	Akonolinga	Akonolinga	Akonolinga	Yaoundé	Yaoundé
Distance to urban market (km)	96	90	61	80	56	60	65
ICRAF marketing project	Yes	No	Yes	Yes	No	Yes	No
Year of 1st project intervention	2003	–	2005	2009	–	2009	–
Membership of <i>njansang</i> group (number of households, 2010)	86	–	56	25	–	35	–
Year of 1st group sale	2005	–	2005	2009	–	2009	–
Sampled households (n)	26	31	26	15	30	26	28
Sampled proportion of all households commercializing <i>njansang</i> (%)	30	19	14	25	19	64	64
Ethnic groups ^a	Essanvang, Yeyen, Essibonda	Yebokolo	Yebokolo, Oveng, Yebesso	Yebokolo, Oveng	Yendjock	Yengono, Yendjock, Mbogdjom	Yengono, Yendjock, Yedouma

^a All ethnic groups observed belonged to the Beti-Pahuin group of the Bantu family

Table 4 Proxies evaluating social capital in project households

Questions	Answer possibilities
Bonding—structural	
Which voluntary associations/groups exist of in this village? ^{a,d}	Open
How many members does each group have? ^{a,d}	Number
How many groups are you voluntarily associated to? ^d	Number
Which groups do you find the most important? (top 3)	Open
How many members in the njansang group are also members in other groups you belong to? ^d	Few (<1/3); moderate (≥ 1/3; <2/3); many (≥ 2/3)
Do you work together in small groups for njansang related activities? ^{c,d}	Yes/no
For which activities? ^d	Open
With which frequency during periods of need? ^d	Times/month
Did you work already in small groups for njansang related activities before the project came? ^d	
With which frequency? ^d	Less; equally; more
Did you work already in small groups for other activities before the project came? ^d	Yes/no
Bonding—relational	
How did your relations with the members of the njansang group change?	3-point Likert-item ^b
How did your relations with all farmers in the village change due to njansang commercialization? ^d	3-point Likert-item ^b
Do you trust the members of the njansang group more or less?	3-point Likert-item ^b
When you are in need, will members of the group help you more or less than before the group existed?	3-point Likert-item ^b
Did your capacity to resolve problems change?	3-point Likert-item ^b
If so, where/when do you apply this skill?	in <i>njansang</i> group; in other groups; in the household; other
Bonding—cognitive	
Did your pride to belong to this village change?	3-point Likert-item ^b
Do you feel whether or not the unity in the village changed, that you are more or less united?	3-point Likert-item ^b
Bridging—structural	
Did you create new professional contacts with individuals from outside the village through the project?	Yes/no
With which frequency do you have contact with them?	Rarely; 1 time/year; multiple times/year
How many other professional contacts do you have outside the village that you contact at least once a year (not linked to the project)? ^d	Number
Bridging—relational	
Do your trust people from outside the village in general more or less since the project arrived?	3-point Likert-item ^b

Table 4 continued

Questions	Answer possibilities
Do your trust traders from outside the village more or less since the project arrived?	3-point Likert-item ^b
Linking—structural	
If you need information on njansang commercialization related issues, who do go to? ^d	Open
Do you contact ICRAF and partners for other reasons?	Yes/no
Linking—relational	
How would you describe your relationship with the development organization?	Open/focus group discussion
Linking—cognitive	
How do you perceived successful Njansang commercialization and the outcomes it should provide? (score the indicators; see Cosyns et al. 2013)	Focus group discussion

^a Data collected during focus group discussions

^b 3-point Likert items evaluated change and could all be reformulated as: −1: negative change; 0: no change; and 1: positive change

^c Refers to small groups and activities besides those of the *njansang* group

^d Data also collected in control villages, sometimes slightly rephrased questions

2011. The number of proxies in each of the dimensions resulted directly from the field observations and focus group discussions, and reflected the complexity and current state of the different dimensions of social capital in the villages. Hence, bridging social capital was restricted to measuring the structural and relational dimensions as cognitive dimensions such as shared representations or common goals between farmers and traders were not specifically promoted by project interventions, and during focus group discussions stakeholders stated that these cognitive dimensions did not change in the 2005–2010 period. The proxies used in the present study are a combination of proxies presented in literature (The World Bank 2010; Kusters et al. 2006; Narayan and Cassidy 2001) adjusted to the local conditions, and new proxies taking into account the specific situation in the study environment. Data on many proxies were only collected in project villages and not in the control villages as they were related to the project's interventions (Table 4).

To study the structural dimension of bonding social capital, membership overlap between the *njansang* group and the other organisations a farmer belonged to was estimated. This was done using the fifth proxy in Table 4. In control villages, no *njansang* group existed so a fictive *njansang* group was created of which the members were all the farmers commercialising *njansang* in the village. Based on this list of names, households in each village could estimate the membership overlap with this fictive *njansang* group.

Statistical data analysis was conducted with SPSS 17 (SPSS Inc. 2008). For some tests, household data of project villages were pooled and tested against pooled household data from control villages. Collected data types were mainly ordinal and nominal thus leading to non-parametric statistical tests.

Results

Based on the research framework, results for bonding, bridging and linking social capital are represented separately. Then, within these three main categories, structural, relational and cognitive aspects are examined.

Structural Aspects of Bonding Social Capital

The Importance of Njansang Groups

Njansang groups were medium-sized groups compared to the other associations the interviewed farmers were involved in (Table 3, ‘number of members in njansang groups’). Larger groups (3–5 times larger) were generally religious and financial associations, smaller groups were ‘rotating savings and credit associations’ locally known as ‘tontines’, typically consisting of 5–10 persons and functioning as informal saving and credit organisations.

The importance of a njansang group, with respect to the creation of new connections, was evaluated on a 3-point Likert-item. The options on the Likert-item quantified membership overlap between the njansang groups and other groups the household member belonged to (Table 4). Both in the project and control group, membership overlap was estimated to be >33 % by more than 50 % of the households, and >66 % by more than 35 % of the households. However, membership overlap in control households was significantly lower than in project households (χ^2 , $p < 0.001$). In addition, the perceived importance of the njansang group in comparison to other groups was evaluated using a ranking exercise. All project households ranked the njansang group among the three most important groups they belonged to: 50 % of them put the group in first place; 34 % in second and 16 % in third. On average, households in the project villages belonged to 3–4 groups, while those in control villages belonged to 2–3 groups.

Subgroups to Tackle Njansang Activities

Project interventions stimulated the formation of subgroups among farmers to tackle their njansang-related activities more efficiently. Before project interventions, farmers tended to already work in small groups for some livelihood supporting activities (mainly agricultural activities) (81 and 72 % of project and control households respectively). Nevertheless, for njansang related activities only 4.6 % of the project households collaborated and 3.8 % of the control households, and there were no significant differences between them (χ^2 , $p = 0.996$). In 2010, farmers had joined forces on njansang related activities with 23.4 % of project households working in subgroups, which was significantly different from control households where only 3.4 % did so (χ^2 , $p < 0.001$). Furthermore, the frequency of collaboration was also higher for project households. This frequency was expressed as the number of times subgroups met during labour-demanding months for njansang activities. Farmers in project villages gathered up to 6 days a week during

periods of high labour demand, collaborating for the most important activity of the subgroups, i.e. collection of njansang fruit.

Relational Aspects of Bonding Social Capital

Assessing the Quality of Relationships

Changes in the quality of relationships in project villages were assessed with two proxies, both interpreted on a 3-point Likert-item (Table 4). The first proxy, the quality of relationships within the njansang group, demonstrated a positive change between 2005 and 2010 (Table 5). For the second proxy, representing the relationship changes in the entire village, a similar number of farmers, perceived ‘no change’ or a ‘positive change’, resulting in a mean value of 0.48. The latter proxy at village level was also evaluated in control villages and control households perceived a slightly positive change (0.27) which was significantly smaller than the value for project households (Mann–Whitney U-test, $p = 0.008$).

At village level Epkwassong showed very positive social changes with regard to relationship quality. Ninety-six per cent of the farmers indicated a positive change in relationships between njansang group members in comparison with other project villages where values between 50 and 70 % were recorded.

A Closer Look into the Changed Quality of Relationships

The perceived relationship changes in project villages were investigated in more detail by considering them from four perspectives (Table 5). All changes were evaluated as positive, in particular the change in trust between group members as

Table 5 Proxies evaluating the change relational aspects with respect to bounding in project villages

Proxy	Specification of measurement level	Mean value	SD
Bonding—relational			
Evaluation of relations’ quality	In <i>njansang</i> group	0.67 ^a	0.512
	In village	0.48 ^b	0.528
<i>Detailed evaluation of relations’ quality</i>			
Trust between farmers	In <i>njansang</i> group	0.85 ^a	0.396
Actual and/or potential assistance received	In <i>njansang</i> group	0.42 ^{b,c}	0.641
Capacity to resolve conflict	In general	0.83 ^a	0.383
Relations within the household	In household	0.70 ^{a,c}	0.463
Number of conflicts in village		0.28	0.690
Bonding—cognitive			
Proud of village		0.88 ^a	0.359
Cohesion, same goals in village		0.78 ^a	0.419

All proxies were scored on a 3-point-Likert items with -1 = negative change, 0 = no change and 1 = positive change (different letters indicate significant differences within a cluster; for more detailed information about the proxies one is referred to Table 4)

well as farmers' capacity to deal with conflicts. The acquisition of this latter capacity was intended by the project to improve njansang group functioning. This versatile capacity was also applied in other situations. One third of households claimed they applied this skill in the njansang group, 25 % also used it in other groups and a remarkable 87 % also applied the technique to resolve and prevent conflict within their households.

Another proxy was the change in assistance (actual or potential) farmers receive from the other group members. The mean value (0.42) of this proxy was slightly positive, although some farmers observed a negative change which was reflected in the high standard deviation. The farmers observing a positive change reckoned that they would receive physical (67 %), material (45 %) and financial (55 %) aid if and when they needed it.

The change of conflict incidence in the village since the onset of the project was also evaluated. Results indicated a slight decrease in conflicts, although the high standard deviation again implies that opinions varied with some farmers saying that conflicts had increased.

Cognitive Aspects of Bonding Social Capital

The cognitive proxies, which represent the shared representations and interpretations within the village, changed positively between 2005 and 2010. Farmers had become prouder of their village and they perceived more unity with the other villagers. The values for both proxies are very high (Table 5) and reflect the changes occurring in the project villages.

Structural Aspects of Bridging Social Capital

To assess whether the structural components of bridging social capital improved more in project than in control households, a distinction was made between whether or not a farmer's external professional contacts were created as a result of the project's interventions. The number of external professional contacts, related to njansang commercialisation, established without project interference, differed between project and control households (χ^2 , $p < 0.05$). More project households (43 %) had professional contacts with persons from outside the village than control households (25 %). In addition, the number of contacts per farmer was higher in project villages (Mann–Whitney U-test, $p < 0.05$). Thirty percent of the project households had more than five professional external contacts; the highest number in control households was only five.

Subsequently, the establishment of new professional contacts as a consequence of project interventions was investigated. In project villages 56 % of all households established new professional contacts. These new links were intensively used with 71 % of farmers indicating that they used them 'several times per year'. Forty to sixty per cent of all households had no professional contacts before project interventions. In addition, in all villages but one, more than 80 % of farmers, establishing new professional contacts, were already externally connected prior to project interventions. Moreover, only about 10 % of the formerly not-linked farmers

established professional contacts through the project's interventions. These results suggest that households who would need to be better linked, i.e. those without any external professional contacts before the project, did not benefit substantially from the project interventions. An exception to this observation was noted in Epkwassong where up to 62 % of all newly-linked farmers had no prior professional contacts. Moreover it was found that the absolute number of links created in this village was much higher (>60 % higher) and the number of farmers without any links lower (>50 % lower) than in other villages. Hence, the results show that the project intervention was able to establish professional contacts between the formerly unlinked households, but that such links take time to establish.

Relational Components of Bridging Social Capital

Project households indicated a positive change (0.28; SD = 0.591) in their trust in outsiders. Their trust in traders, with a value of 0.68 (SD = 0.621), showed a significantly larger increase (Wilcoxon Signed-Rank Test, $p < 0.001$). The rather high standard deviations imply that a minority of respondents felt their trust decrease.

Linking Social Capital

One quarter of the project households relied on the development organisation for advice on njansang commercialisation or related issues (Fig. 1). The main source of information in project villages was the njansang group, while in control villages households relied on other households. The latter households generally have access to information by communicating with external parties, mainly family members or friends living in urban centres. Furthermore, only 3 % of all project farmers indicated that they contacted the development organisation regarding issues which had no relation to njansang commercialisation and the project interventions.

The relational component of linking social capital was considered good to very good by all farmers. The farmers' only criticism was a sometimes delayed/difficult communication with the development organisation but they confirmed that this was mainly caused by the periodically very bad accessibility of the roads.

The cognitive dimension of linking social capital indicated that farmers and the development organisation shared the same ideas of what successful njansang commercialisation should incorporate. In Cosyns et al. (2013), these cognitive aspects are discussed in more detail by studying the importance of 27 indicators of farmer livelihoods according to farmers and development organisation staff.

Discussion

This study demonstrated that social capital can be successfully generated through external interventions. The results, based on the analysis of the proxies, indicated that aspects of bonding and bridging social capital were enhanced in project households. These findings are hereafter elucidated, linked to qualitative data and positioned within related research.

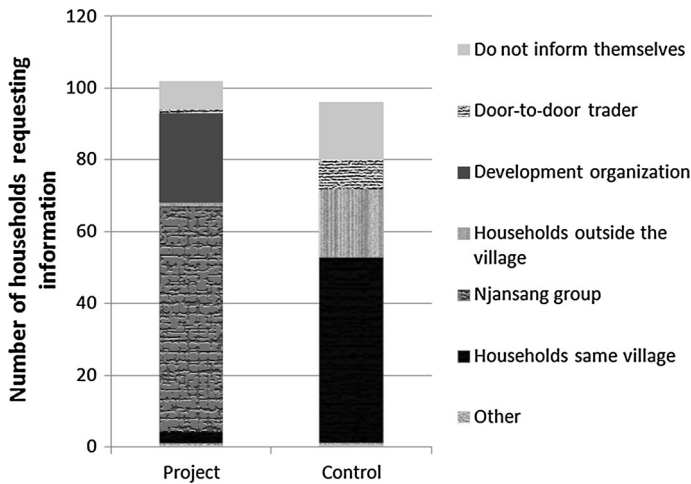


Fig. 1 The total number of households in project and control villages requesting information about njansang commercialisation and related issue by source

The Njansang Group: A Group Strengthening Old and New Relationships

The creation of new producer groups in the villages, which lay at the core of the project's interventions, was important on multiple levels. As a structure, the group provided farmers with an additional organisation to unite, enriching their social network and increasing their number of relationships. Although most farmers indicated that a number of members of the njansang group belonged to other groups they were associated with, households were able to make new relationships and were pleased to actually establish a connection with several of their neighbours for the first time.

Besides their membership of the njansang group, households united in small groups to deal with njansang-related activities more effectively. Ayuk et al. (1999) found in their study on uses, management and economic potential of *R. heudelotii* that small groups of women in Cameroon carried out njansang-processing activities together, but this was not a frequent observation. In present study this type of small collaboration existed already for many other activities, leading to a rather small added structural value of these new subgroups. Nevertheless, the high frequency at which some households collaborated for njansang-related activities, to limit losses of kernels caused by predating Gambian rats (*Cricetomys gambianus*) and squirrels (*Funiscurius pyrrhopus*), underscores the importance of njansang commercialisation and must have had an impact on the overall group cohesion.

Change of relational aspects introduced by the njansang group seemed very important. At the core of these changes lie the intensification and reinforcement of existing relationships, as well as the creation of new strong relationships. Farmers often mentioned that to achieve the group's objectives and structure, they were obliged to work closely together which created strong relationships between members. As a result, proxies evaluating the relational aspect were invariably graded positively.

Finally, the cognitive aspects of bonding social capital within the group and the village also increased over time. This was not only due to the existence and activities of a njansang group, but also to the presence of a facilitating organisation in the village and the frequent visits made by its agents and other visitors. Farmers felt proud that their village had been ‘chosen’ to benefit from the project interventions and hence its presence has heightened the status of their village in the region.

The Downside of External Interventions

Although the majority of social outcomes of the project interventions were positive, a number of negative aspects were also observed. Conflicts between farmers related to njansang commercial activities actually increased between 2005 and 2010, in particular those related to tree property issues and collection rights (e.g. Brown and Lassoie 2010). Nevertheless, farmers who received the conflict management training claimed to be better able to deal with these quarrels. Furthermore, other conflicts were village specific. For instance, in Ondeck, some farmers did not join the group but sold their products via one of the group members. They bypassed the obligatory fees which created arguments within the group.

Finally, there were conflicts originating from the empowerment of women. Njansang commercialisation is mostly done by women (e.g. Ayuk et al. 1999). The increased cash income these women obtained caused conflict in some households because traditionally men provide the cash income in Bantu families by trading cash crops such as cocoa (Degrande 2005).

Training Sessions as a Pillar for Sustainability

Education through training sessions provided by the facilitating organisation increased the capacity of the project households to successfully commercialise njansang. The importance of proper training in rural development has been stressed by several authors (World Bank et al. 2009; Collett and Gale 2009). In this study, proxies measuring social capital related to training received were evaluated more positively than other proxies. The change of trust between group members and villagers improved in general as well as their capacity to deal with conflicts and can be attributed to the results of training sessions.

Conflict management was an issue dealt with during training sessions; the results were apparent and its fruits manifested on different levels. First, it improved the functioning within the group. Next, it influenced the functioning of other associations and groups within the village and finally even had an impact at household level. Diffusion of acquired information and skills related to njansang was found to be easier within households than between different groups within the village. Degrande (2005) similarly found that collaboration and interaction between groups in a village are generally very weak. In Loum, conflict training had not yet been organised and this was reflected in the responses of the farmers. Loum had the highest percentage (21 %) of respondents indicating an increase of conflicts within the village, and the lowest percentage (7 %) mentioning a decrease. In contrast in Epkwassong 81 % of farmers had observed a positive change.

To conclude, results indicated that capacity building in the form of training sessions stimulated and enhanced changes in social capital. This effect has also been described by other authors (Pronyk et al. 2008; Danida 2004). Other studies have mentioned the need for farmers to realise benefits from training before they are willing to invest in capacity building (Collett and Gale 2009), a precondition which was met in this case study through the increased financial benefits the households had (Cosyns et al. 2011).

Building Bridges

Proxies related to bridging social capital evolved positively in project villages in contrast to control villages where, right from the first data collection in 2010, it was observed that bridging social capital with respect to njansang-related activities rarely occurs and has not changed during the last decade. Control households still sell their product to door-to-door traders (bayam-sellam) who visit the villages occasionally.

Farmers in project households stated that their trust increased in traders linked to the farmers by the AFTP4A project. At the same time farmers did not hesitate to express that their trust in door-to-door traders had declined.

Project and control households had a different number of external contacts also without taking into account the contacts established via the project. This difference reflects the involvement of wealthier households with more social links commercialising njansang in project villages (Cosyns et al. 2011) whereas in control villages trading njansang is typically an activity of the poorer farmers (Cosyns et al. 2011). Financial wealth and economic development have often been linked to a more advanced degree of social integration (Putnam et al. 1993; Woodhouse 2006). In addition, it was initially farmers who already had external relations who established new professional relations facilitated by the project's interventions. In a later phase of the project, the farmers without any external connections also created external professional contacts. This suggests that creating bridging social capital takes time, especially to disseminate to the poorer households (e.g. Teilmann 2012; Lewis 2010).

Bridging social capital has been found to be of main importance to enhance development (Granovetter 1973; Lin 2001; Teilmann 2012), in rural areas in Africa in particular (e.g. van Rijn et al. 2012). The poor have typically strongly developed bonding social capital (sometimes impeding economic development) but lack bridging social capital (Woolcock and Narayan 2000). It is thus vital for rural development projects to ensure that the creation or enhancement of bridging social capital has reached the targeted people and shows signs of sustainability; or all efforts will have been in vain. Considering the short cycles of many development project interventions, this will be a challenge.

Linking Social Capital is Limited in Time

One quarter of the farmers actively used their connections with the development organisation at the time the study was performed. Given that at the time of study the development organisation staff was regularly physically present in the villages, this

is not surprising. However, the development organisation approach is that once the project is concluded villages would be able to operate alone. Hence, project interventions did not focus at all on sustainable linking social capital and the current links that are used will very likely cease to exist after the project ends.

Success by Mutual Enforcement

The successful creation of social capital was linked to the improvement of other farmer livelihood assets. It is crucial for farmers to experience short-term improvements in order for projects to survive in the long-term (Collett and Gale 2009).

In this study a mutual reinforcement between social and financial capital was observed. On the one hand, social capital was indispensable for njansang group functioning, but in addition organising group sales was crucial to increasing farmers' revenues. On the other hand, increased financial capital provided households the opportunity to support other needy households and even provide loans, thus strengthening the socio-economic relationships in the villages.

Although, initially, both social capital and financial capital were mutually dependent and reinforced each other, currently, even if financial benefits would disappear and the njansang group would disband, many positive social benefits are likely to continue. Moreover, many aspects of the acquired social capital diffused in farmer livelihoods even influencing the household's functioning.

The acquisition of social capital was closely linked to njansang group functioning and in particular, to the skills and understanding they received through training sessions from the project (Table 1). Similar results were described by Cleaver (2005) and Pronyk et al. (2008); the latter authors concluded that interventions combining group-based microfinance provision to stimulate income-generating activities, accompanied by capacity building on gender and HIV issues, could enhance many aspects of social capital. Pronyk et al. (2008) also described the mutual reinforcement of social and financial capital. The comparison of the different villages showed an increase of social capital with time. This is to be expected as social capital is maintained and strengthened by using and applying it sufficiently (Ostrom 2000).

Conclusions

This study shows that social capital can be improved through external interventions. In this particular case, social capital was enhanced through the interventions of a project of the World Agroforestry Centre to promote *R. heudelotii* kernels commercialisation in rural households in Cameroon. The improvements of social and financial capital were mutually reinforced and effective creation of social capital was, especially in the initial project phase, closely related to the wider framework of promoting njansang commercialisation. Hence, it is stressed that to create effective and sustainable social capital farmers should experience other (short-term) benefits which improve their livelihoods significantly.

Creating a solid social organisation, in combination with short-term benefits for farmers are of major importance to obtaining sustainable changes. Furthermore, the importance of capacity building provided by the sponsoring organisation contributed significantly to the rapid creation of strong social links. The acquired skills were applied under a variety of circumstances outside njansang groups indicating that changes in social capital are likely to persist over time even when njansang groups disappear. However, the real added value of development projects lie in creating bridging social capital which is sustainable; time will tell whether or not this was accomplished in the present study. Thus, while successful creation of social capital by a development organisation is possible if embedded into a wider approach to ameliorate livelihoods, it remains a precarious and complex matter with many challenges yet to be examined.

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